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# UTCS ComputerNews

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## Services at the Micro Lab

*Don Gibson*
DON at UTORONTO

Since the establishment of the Micro Lab and related services, UTCS has charged users only for consumable items such as paper and toner. Thus far there has been no continuing budget for the equipment required to support this area.

Last year we were very fortunate that some money resulting from one-time savings was allocated to upgrading micro-related activities. This money was spent in several major areas. Various pieces of equipment and software were added to the Micro Lab. The Education Facility was upgraded with IBM PCs and Novell Software, and copies of WordPerfect and SAS/PC were installed. Finally, we were able to strengthen our micro-related print offerings by purchasing several PostScript devices, including the Linotronic 100 typesetter. Also, last spring we received a grant of 11 Macintosh SEs from Apple Canada to establish a Macintosh-based classroom. While we are attempting to make beneficial arrangements with other vendors of both hardware and software, expenditures are constantly required to replace worn equipment and to keep up with current market standards.

Again this year, as in past years, our Annual Plan called for the need to establish a continuing budget for the support of micro-related areas. And again, our Review Board recognized and assigned high priority to the issue. This year, I am happy to report, some one-time and some continuing monies were assigned to micro support. However, the funds available will not go far after we have paid the $15,000 - $20,000 required to provide only the physical classroom for the Macintoshes.

In reviewing our Annual Plan, our Board acknowledged that we should charge for more of our services. The time has come for micro-related services to earn a greater portion of their keep. For the present we will keep most information-based services free of charge. For instance, there will be no charge for using the Micro Lab to evaluate hardware or software. Likewise, there will be no charge for using the Bulletin Board. However, those services that have more of a production nature will cost more (see the list of price changes following this article).

We have kept prices well below those of the commercial world and in general below those charged at other academic institutions.

As a part of our price review, we have also reevaluated the fees charged for our noncredit short courses. In the past, we have charged $10 per student per course, with the fee waived for groups organized by a department within the University. The purpose of this fee was only to establish the seriousness of the student's intention to attend the course. The new prices for courses will be about $5 per instructional hour per student. Hence, the total cost for most courses will be either $50 or $75 per student. To further offset the costs to the University community, we will now register students from industry and government. The fees for these external students will be considerably higher than those levied against members of the University (e.g., $300 for WordPerfect and $250 for SAS/PC).

It is never good news to announce that prices are rising, but we hope that you will still find our fees more reasonable than those charged elsewhere.

### New Prices for Micro Services

***As of August 1, 1987***

| | |
|---|---|
| **Apple LaserWriter** | |
| Per 1/4 hour | $3.00 |
| Per Page | $0.20 |
| **TI 2115 OmniLaser** | |
| Per 1/4 hour | $3.00 |
| Per Page | $0.15 |
| **Linotronic 100 Typesetter** | |
| Per 1/4 hour | $3.00 |
| Per inch | $0.40 |
| **Micro Laser Printing** | |
| Per Page (1st copy) | $0.17 |
| Per Page (other copies) | $0.07 |
| Per 1/4 hour | $1.25 |
| **Polaroid Palette 35mm Slide Maker** | |
| Per Instant Print | $2.00 |
| Per Slide Mount | $0.10 |
| Per 1/4 hour | $2.50 |
| **Other Micro Usage (per machine)** | |
| Per 1/4 hour | $1.25 |

# The Mac SE

*Alicia Damley*
DAMLEY at UTORONTO

In January 1987, Apple announced several new products that had been eagerly awaited. Among them were two new Macintosh models, the Macintosh II and the Mac SE. The Mac SE is faster than the Mac Plus, but slower than the Mac II. Here at UTCS, we have several Mac SEs, generously donated by Apple Canada, which are destined for our Macintosh Education Facility. This article summarizes our experiences with these Mac SEs so far.

The SE, though faster than the Mac Plus, uses the same processor, namely the 68000 microprocessor. The faster speed is the result of hardware and software changes. The improved performance is clearly demonstrated in the startup time, the time required to launch an application, and the response time in performing a series of keystrokes and/or mouse clicks. The SE runs Finder 5.4 and System 4.0, LaserWriter 3.3 and ImageWriter 2.5. It is important that the appropriate versions of all system software (including printer drivers) be used together with the appropriate machine. At the end of this article is a reference chart from Apple Canada outlining the recommended system software configurations.

One of the new enhancements under the System/ Finder is a **Restart** command under the Special menu; it allows you to do just that, restart the machine. This command will eject any diskette(s) in the internal or external drive, so if you need to boot from a floppy instead of a hard disk, you must be quick in reinserting the floppy. The **Shutdown** command, which was introduced earlier, has been modified with a dialog box instructing you either to turn off the machine or, if you wish to continue working on the machine after all, to click the Restart button. Using **Shutdown** is recommended before you turn the machine off, as it closes files properly and makes sure all is in place on your disk. Other changes include a Trash can that “bulges” when anything is put into it and a clock whose hands turn whenever the machine is doing a copy or some other intensive task.

Apple has changed the look and feel of its keyboards. Our SEs have the Apple keyboard that uses a new typewriter style layout, with a numeric keypad and cursor keys. One application for which I have used both the keypad and cursor keys is Microsoft Word 3.0. The keypad also has a less “chunky” feel to it, making typing easier and smoother. Control and Esc keys have been added, but I have not tried an application in which I have needed either of them. The Caps Lock, ~ (tilde), and arrow keys have been slightly rearranged. The Command key (cloverleaf) now has both a cloverleaf and an apple depicted on it and is also called the Apple key. It still functions as the Command key. The Command and Option keys are now right beside each other. This is particularly useful for applications such as Adobe’s Illustrator, which provides functions when both keys are held down in combination with another. The Backspace key has been renamed the Delete key. Overall, the keypad has a more functional layout. Note, Apple also introduced the Apple Enhanced Keyboard, which includes Function keys and Special-purpose keys in addition to a numeric keypad. Apple has also improved its mouse, which is now much sleeker, more responsive, and more easily held in your hand.

The SE provides two Apple Desktop Bus™ (ADB) ports for such input devices as keyboard, mouse, or graphic tablet. Both are now located at the back of the machine. Apple states that up to 16 input devices may be connected simultaneously. The keyboard itself has provisions for plugging the connector on either the right or left side according to your preference. The mouse may then be plugged directly into the keyboard on either the left or right side depending on which hand you use.

Our Mac SEs have one 800KB floppy disk drive and one 20MB SCSI internal hard disk. Note, the SE may be configured instead for only two 800KB internal floppy drives. Hard disk access on the SE is much faster than on the Mac Plus. According to Apple, it is twice as fast. There have been no problems using any 800KB diskettes created on the Mac 512K or Plus. All

continued...

**The Mac SE** continued

the software I have tried so far runs just as well on the Mac SE as it did on either the 512K or the Plus (except faster). This includes Microsoft Word 3.0 and 1.0, PageMaker 1.2 and 2.0, Illustrator 1.0, MacWrite 4.5 and 4.2, MacPaint, and various other shareware and public-domain software.

The Mac SE is a promising new addition to the Macintosh family. The improvements in performance make it easier to use and more productive.

We would like to thank Apple Canada for their generous contribution. We believe it demonstrates their commitment to higher education, especially here at the University of Toronto.

Recommended System Software Configurations

| | Macintosh 128 | Macintosh XL | Macintosh 512K | Macintosh 512KE | Macintosh Plus | Macintosh SE | Macintosh II |
|---|---|---|---|---|---|---|---|
| System 2.0/Finder 4.1 | ☻ | | | | | | |
| System 3.2/Finder 5.3 | | ☻ | ☻ | ☻ | ☺ | | |
| System 3.3/Finder 5.4 | | | ☻☻ | ☻☻ | ☺☺ | | |
| System 4.0/Finder 5.4 | | | | ☺ | ☺ | ☺ | |
| System 4.1/Finder 5.5 | | | | ☺ | ☻<br>☻☻ | ☻<br>☻☻ | ☻<br>☻☻ |

**Legend**

☻ Best System Software for hardware

☺ O.K. to use

☻☻ Best System Software with AppleShare

☺☺ O.K. to use with AppleShare

4/24/87 DC/GCA/STS

# The Illustrator

*Alicia Damley*
DAMLEY at UTORONTO

The UTCS Micro Lab has recently acquired Adobe's Illustrator, Version 1.00. Illustrator enables you to create both text and graphic images from scratch or to enhance scanned images. These images may then be inserted directly into other documents capable of accepting the Encapsulated PostScript File format (EPSF). EPSF format specifies the structuring standards or conventions to which applications should adhere when creating PostScript files. A standard format allows a page image from one application to be incorporated into another application. An example of a program that accepts EPSF files is Aldus' PageMaker 2.0. Documents in Illustrator are stored in PostScript, so that when they are printed, the resolution of the images is consistent with the quality of the printer.

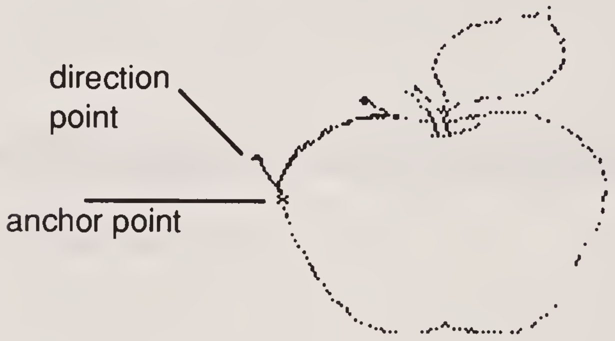
Illustrator has three distinct document formats: template, artwork, and the preview image. Any image stored in MacPaint format (created or scanned) or any scanned image stored in MacDraw PICT format may be used as a template. This template may be traced and transformed into artwork format. The finished graphic may then be displayed on the screen in preview format before printing on a laser printer or typesetter.

Tracing is done by establishing anchor points and direction points along the outline of the image. The anchor points mark the end points of a line segment; the direction points determine the shape of a curved line. Anchor points without direction points produce a straight line. Curves may be adjusted to match the template's outline by clicking on the curve itself or on the direction points.

The following is a sample session with Illustrator to demonstrate some of its features.

Let us assume we have a scanned image that we would like to improve. Below is the image after it has been scanned.

Illustrator's pen tool can be used to trace the scanned image. By selecting points on the scanned image, you can use that image as a template for the final picture. First you click on the image to set an anchor point and drag to set direction points.



Then, by selecting points along the image, you can trace the outline completely.

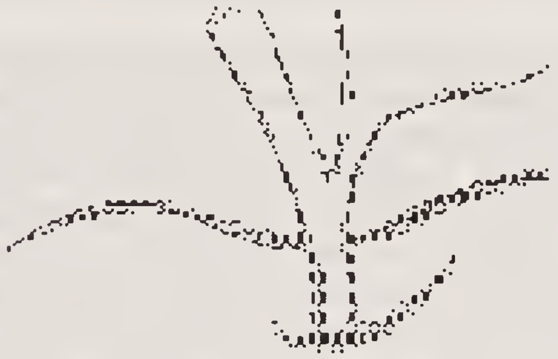
Adobe has made it easier to switch between the moving, selecting, and tracing modes of editing: all of these may be achieved by simply holding down a combination of the Spacebar, Command (Apple) key, and Option key.

Illustrator features a nine-level magnification capability (6.75% - 1600%). This is very useful for viewing even the smallest details clearly.

continued...

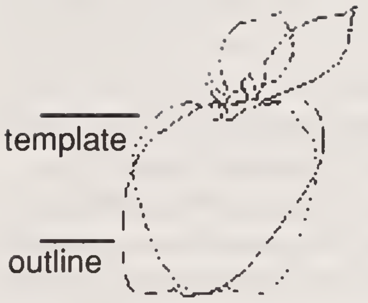
**The Illustrator** continued

Below is a view of our apple image magnified three times. Note that the curves **we** traced do not break down into bit patterns as do those of the scanned image. This happens because Illustrator represents the traced curves mathematically.



Once the editing and tracing are completed, the image may be further enhanced by adding paint to create the artwork format. Objects may be filled with varying shades of black or, on a colour monitor, with colour. Outlines may be stroked or may have no edge at all. In addition, the outline may be specified with line weights (0-point to 4-point thickness), a line-cap style (to affect the appearance of endpoints or open points), a line style (solid or dashed, and the type of dashed pattern), and a line-join style (to affect the appearance of corner points — miter, round, or bevel). For both the stroked and filled objects, a "flatness" parameter may be specified. This determines the maximum distance, in pixels, of a point on the traced curve from the corresponding point on the original curve.

Other effects that may be applied include scaling (vertically, horizontally, and diagonally), rotation (which may be specified in single-degree quantities), reflection along a specified axis, and shearing along a specified axis. Below is an example of our apple image sheared along a 25° axis.



**Template & Outline**

**Preview**

The finished image may be previewed on the screen to show what it will look like when printed. This preview image may be incorporated into other applications. If the application supports the EPSF format, Illustrator artwork may be merged directly into the document. However, not all applications accept EPSF format. With those that do not, the image may be copied to the Clipboard and then pasted into another document. The only requirement is that the application be able to accept PICT format data from the Clipboard. This transfer is achieved by holding down the Option key while choosing Copy from the File menu. From here, the image can be pasted into the application. The preview image below has been merged using the EPSF feature.

The suggested list price for Illustrator is approximately $700. However, various educational discounts are available. When shipped, the software is copy protected. But according to the instructions, once the registration card is sent in, Adobe promises to send out a non-copy-protected version.

Overall, this program provides a unique and flexible interface for finishing images with a modest amount of effort.

# Which to Choose: An IBM PC-XT, an XT clone, or a Model 30?

*Paul Roth*
PROTH at UTORONTO

With the introduction of the new IBM PS/2 Model 30 (see articles in the May/June *ComputerNews*), first-time microcomputer buyers are faced with a difficult decision: should they choose this machine or purchase one of the old-style XT machines? This has become even more complicated since the prices of XT clones (and even IBM XTs) have dropped dramatically.

### XTs and Clones

While IBM has already stopped making new XTs, some are still available and are considered a "safe" purchase: **boards** as well as software will be compatible with a true XT. But the number of XT clones available in Toronto is astonishing, and they are priced so low that those of us who spent $3000 a few years ago for a dual-floppy machine are filled with envy.

The XT clones usually offer features that improve performance over the IBM PC-XT. Most commonly, they use a processor chip other than the IBM XT's 8088: the 8088-2, an 8086, or one of the NEC series (V20, V30, or V40). Thus, the clock speed of the processor is substantially greater than the 8088's 4.77 megahertz (MHz). The 8088-2 offers a switchable speed, for instance, allowing a 4.77 and 7.16MHz clock speed. The 8086 runs at 8MHz. The NEC V series offer roughly 20 percent improvements in speed over their counterparts.

Aside from processor speed, the clones may offer other extra features as well, such as a hinged-top cover for the system unit (useful for the hobbyist and for anyone changing or testing boards frequently), or a hardware reset switch. Clone-makers generally offer package deals, whereby you get, say, 640 kilobytes (KB) of RAM, one floppy drive, a 20 megabyte (MB) hard disk, a monographics card (Hercules clone), and a TTL monochrome monitor. This is a complete system, ready to run if the dealer puts DOS on it for you. The price is affordable to many people, costing not too much more than any other major appliance.

There are at least three stumbling blocks with clones, however. Firstly, the machine may be incompatible with the software or hardware you expect to use with it. In general, software compatibility is high, although some out-of-the-way software may not run. You are more likely to find a problem with hardware: some boards made for the IBM PC simply will not work with some clones. Make sure your software and hardware are compatible *before* you buy.

Secondly, you must consider service. If the dealer goes out of business two weeks after you buy, then your fantastic one-year on-site warranty will not do you much good. In other words, weigh the soundness of the dealership against the degree of support and service you might need from your dealer. One that has been around for a few years, stands a better chance of surviving your warranty period. If you are relatively independent and can repair the machine yourself, then the dealer's business standing may be irrelevant.

Lastly, consider that by investing in an IBM PC-XT or XT clone, you may be buying a machine with a limited future. IBM has stated that its operating system future is OS/2, not DOS, and OS/2 simply will not run on IBM PC-XTs or XT clones. In addition, the latest graphics technology (i.e., the display adapter/monitor combination) is costly on an XT: this is especially important if you are using colour, since the palette for XTs is extremely limited compared to the new PS/2 machines. This limitation will become increasingly significant as new software is written to take advantage of the PS/2 colour capabilities. Such software may be nearly useless on XTs; it could be similar to running old software written for the Colour Graphics Adapter on a monochrome monitor: a part of the screen intended to be red, for instance, is scarcely legible.

Graphics board manufacturers are scrambling to duplicate the MCGA standard inexpensively on an XT add-on board. This may provide relief to XT owners desiring higher-quality images, but it will add another opportunity for incompatibility between the board-makers' emulations and any future software. Each level of "cloning" has its price.

continued...

**Which to Choose:** continued

### PS/2 Model 30

Let us now consider the Model 30, the low end of the new IBM PS/2 line. It avoids all of the drawbacks mentioned above with the exception of not being able to run OS/2. The Model 30 uses an 8086 (running at 8MHz); only an 80286 or 80386 can run OS/2. Apart from this, the Model 30 is an attractive proposition. It is reasonably, albeit not cheaply, priced. It is best used with colour systems, offering colour and resolution superior to its predecessors'.

The Model 30 does have some drawbacks, however. Most detractors point to its use of 3.5-inch drives instead of 5.25-inch as on the XT. The problem is: how can I get all my existing software, which is on 5.25-inch media, onto this machine? Or, for the first-time user, how can I share my data files with my associates, all of whom have 5.25-inch drives on their machines? Another problem is that existing software either cannot accommodate or does not take advantage of the newer analog displays on the Model 30.

I believe these are not major drawbacks. Data can be transferred in a variety of ways between 3.5-inch and 5.25-inch disks. We do it in the Micro Lab (for a small fee), on an IBM PC equipped with both kinds of drives. An internal 3.5-inch drive for a PC or XT costs under $200, so that a colleague's XT could be inexpensively equipped to solve the diskette-travelling problem. Alternatively, and more expensively, the Model 30 can have an external 5.25-inch drive attached.

A solution to the second problem is hopefully only a matter of time. Software manufacturers are busy creating device drivers for most existing software packages, so that in a few months the problem might be eliminated. This goes for copy-protected software, too: developers are starting to distribute software on 3.5-inch diskettes.

The bottom line on the diskette-size issue is that the 3.5-inch diskettes are here to stay. They have twice the capacity of existing 360KB floppies, they're easier to carry around (in your pocket), and they don't damage as easily. This adds up to value.

The Model 30 has other advantages: the machine is bound to be more reliable, in terms of not needing service, because many of its components are now chips instead of boards as on the XT. The display adapter is an example of this: on the XT, the display adapter takes up a slot and is more subject to hardware failure than the chip(s) used in the Model 30 to perform similar functions.

The physical aspects of the Model 30 are attractive too. It takes up less space and generates less heat than an XT, and its parts can be detached without a screwdriver (making servicing easier).

### Summary

When it comes to a decision between an IBM PC-XT or XT clone, and a Model 30, consider price, performance, serviceability, the quality of your dealer's present and future support, and convenience. If you are considering quality graphics in colour, give the Model 30 a good long look. If your applications are primarily text based, and price is the overriding concern, the XT clones may be best. If software and hardware compatibility are the key decision-making factors, consider the IBM PC-XT, if you can still find one. And if you plan to use the new OS/2 when it comes out, go back to the drawing board: you will need an entirely different class of machine.

# Printing on the Apple LaserWriter from WordPerfect 4.2

*Patricia Hood*
PHOOD at UTORONTO

In order to successfully print on the Apple LaserWriter from WordPerfect, you must set your margins, column positions, tabs, fonts, pitches, and any other character-based numeric values vital to positioning text (such as footnote text margins) to values appropriate for the sizes of characters with which you will be printing.

WordPerfect 4.2 will allow you to print with four font sizes in either the Helvetica or Times fonts. You cannot combine the two fonts within one document, but you can use all four sizes within a document.

The four sizes are available through WordPerfect's "Font" function (<CTRL><F8>,1). WordPerfect makes eight font choices available for any printer. For the Apple LaserWriter they are assigned as follows:

| | **Helvetica** | **Times** |
|---|---|---|
| **Font 1**: | 11 point, regular face | 12 point, regular face |
| **Font 2**: | 11 point, italic face | 12 point, italic face |
| **Font 3**: | 11 point, bold face | 12 point, bold face |
| **Font 4**: | 11 point, bold italic face | 12 point, bold italic face |
| **Font 5**: | 8 point, regular face | 9 point, regular face |
| **Font 6**: | 8 point, italic face | 9 point, italic face |
| **Font 7**: | 5 point, regular face | 5 point, regular face |
| **Font 8**: | 17 point, bold face | 18 point, bold face |

The difference in point sizes between these two fonts is deliberate: the Helvetica font is slightly larger than the Times font; when printed the sizes will look identical. To compare the fonts, see the charts at the end of this article.

WordPerfect's implementation of PostScript printing is hampered by the following design limitations within the package:

1. Margins are specified in characters only.
2. Character sizes are specified in terms of characters per inch (pitch) only.

The program PRHELP,[1] bundled with the WordPerfect software, indicates which pitches should be used with fonts one through eight. While these pitch values have little connection to the actual number of characters per inch in the various fonts, they must be used nevertheless whenever one of the fonts is selected within your document. They must also be used to calculate appropriate left and right margins. By default, WordPerfect uses Font 1, which calls for 10 pitch with the margin settings 10 and 74 (1 inch left and right). The margins are calculated by multiplying the pitch by the number of inches required for each margin. For Font 1 on the Apple LaserWriter, the equivalent settings would be Font 1, 13* pitch, 13 and 97 left and right margins. The table below summarizes the necessary pitches for each of the fonts (no distinction is made between the Helvetica and Times fonts) and margin settings based on one-inch margins.

| Font | Pitch | Left Margin | Right Margin |
|---|---|---|---|
| 1 | 13* | 13 | 97 |
| 2 | 13* | 13 | 97 |
| 3 | 13* | 13 | 97 |
| 4 | 13* | 13 | 97 |
| 5 | 18* | 18 | 135 |
| 6 | 18* | 18 | 135 |
| 7 | 22* | 22 | 165 |
| 8 | 8* | 8 | 60 |

continued...

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[1] The PRHELP program contains the same type of information for all WordPerfect supported printers. See the WordPerfect *Installation and Appendices* manual for information about using PRHELP.

**Printing on the Apple LaserWriter** continued

Other numeric values based on margin settings or characters per inch will have to be revised with the above pitch values in mind.

Some of the Extended ASCII characters, such as accented characters, are available when printing on the Apple LaserWriter. The graphics characters, such as box-drawing characters, are not available.

### To Print at UTCS

To print your document on UTCS' Apple LaserWriter, follow these steps.

1. You must reserve the IBM PC-XT and the Apple LaserWriter. These machines are available from 9:00 a.m. to 6:00 p.m. Monday through Friday in the Koffler Centre, Room 308. Telephone 978-5601 to reserve these machines. The maximum time period for reservations is two hours.

2. Do all necessary preparation of your text prior to your appointment with UTCS. Our machines are dedicated to printing rather than intensive text editing.

3. When you arrive at UTCS to print, introduce yourself to the receptionist. The machines will be readied for printing, and a note will be made of your starting time and the current page count from the LaserWriter. These values will be used to determine the total charge when you have finished printing. (See "Costs" below for specific information about page and time charges.)

4. Next to the IBM PC-XT is a diskette containing software that correctly handles the transmission of data between WordPerfect and the LaserWriter. It is labelled "WordPerfect and the Apple LaserWriter." Place this diskette in Drive A and boot (or reboot) the machine. One screen of messages about the use of WordPerfect with the LaserWriter appears. You will be prompted to "Press Any Key to Continue." When you have done so, you will be inside the WordPerfect program.

5. Replace the diskette in Drive A with a disk containing your WordPerfect files.

6. There are four printer drivers for the LaserWriter, two each for the Times and Helvetica fonts. One of the two allows you to print landscape (parallel to the long edge of the page), the other portrait (parallel to the short edge of the page). UTCS' WordPerfect is set to print using Times with the portrait orientation. If you wish to use Helvetica or to print with the landscape orientation, you must go to the Printer Control menu (<SHIFT><F7>,4) and use Select Printers to choose the appropriate printer. When WordPerfect prompts you for the Printer Port, press <Return>. Do not change this setting. You do not need to change the Type of Forms or Network Printer settings either.

7. When you are satisfied that the correct printer is selected, you can print your document in three ways: by retrieving it to the screen and choosing <SHIFT><F7>,1; by choosing Print from within List Files (<F5>); or by using Printer Control (<SHIFT><F7>,4).

8. If your files were prepared using Version 4.1 of WordPerfect and are retrieved into Version 4.2 for printing, they must be saved using <CTRL><F5>,7 to eliminate incompatibilities between the two versions.

If you encounter difficulties, speak with one of the Advisors or contact Pat Hood at 978-4548.

### Costs

LaserWriter printing has two associated charges: a charge per page and a time charge. Effective August 1, the charge per page is 20 cents, and the time charge is three dollars per quarter hour.

continued...

### Helvetica Font Group

These are the available Helvetica fonts when using the Apple LaserWriter and WordPerfect.

Font 1:

This is an 11-point font, regular face.

*Font 2:*

*This is an 11-point font, italic face.*

**Font 3:**

**This is an 11-point font, bold face.**

***Font 4:***

***This is an 11-point font, bold italic face.***

Font 5:

This is a n 8-point font, regular face.

*Font 6:*

*This is a n 8-point font, italic face.*

Font 7:

This is a 5-point font, regular face.

Font 8:

This is a 17-point font, bold face.

### Times Font Group

These are the available Times fonts when using the Apple LaserWriter and WordPerfect.

Font 1:

This is a 12-point font, regular face.

*Font 2:*

*This is a 12-point font, italic face.*

**Font 3:**

**This is a 12-point font, bold face.**

***Font 4:***

***This is a 12-point font, bold italic face.***

Font 5:

This is a 9-point font, regular face.

*Font 6:*

*This is a 9-point font, italic face.*

Font 7:

This is a 5-point font, regular face.

Font 8:

This is an 18-point font, bold face.

# Reference Materials for SAS and SAS/PC

*Joyce Bernstein*
JBERNST at UTORONTO

UTCS has recently updated its collection of reference materials for both mainframe SAS and SAS/PC users. Our new acquisitions include several new SAS Institute manuals and technical reports, along with the most recent editions of some earlier publications. In addition, diskettes containing raw data and SAS data steps used as examples in several SAS manuals have been acquired. These diskettes may be copied, making it easy to try examples in the manuals or customized versions.

The following is a listing of some of our new reference materials:

### Basic Manuals

*SAS Guide to Macro Processing*

Provides a complete description of the Version 5 facility, including macro variables and functions, macro programming statements, data step interfaces, and the autocall facility.

*SAS Guide to TABULATE Processing*

A detailed account of how to produce a variety of reports in tabular format with PROC TABULATE. Tutorial explanations and sample applications of this widely misunderstood procedure are included. The guide is written for a wide range of audiences, from the first-time user of PROC TABULATE to the experienced user requiring more details on how its features interact.

*Master Index to SAS Documentation, Version 5 Edition*

An alphabetical listing of references to SAS procedures, options, and applications, including entries from all Version 5 user's guides. It is useful for locating the proper manual and procedure for a specific application.

*SAS Applications Guide, 1987 Edition*

An updated and expanded version of the 1980 edition of the *Applications Guide.* This manual is a collection of examples illustrating the use of SAS Base software to solve a variety of data-entry, analysis, management, and report-generation problems. The problems addressed come from suggestions by SAS Base users and are designed to provide detailed solutions for using the SAS system efficiently.

### Statistical Applications Guides

*SAS System for Linear Models, 1986 Edition*

Provides detailed explanations for using PROCs ANOVA, GLM, and REG for various statistical models. The reader who has been frightened away by the treatment of these procedures in the *Statistics* manual will be comforted by the more readable explanations and examples provided here.

*SAS System for Regression*

Another well-written guide. The manual begins with a clear summary of regression terminology and notation. Several SAS procedures used to perform regression are reviewed, including PROCs REG, GLM, AUTOREG, NLIN, ORTHOREG, RSREG, STEPWISE, and RSQUARE. Numerous examples are included for each procedure.

*SAS System for Forecasting Time Series, 1986 Edition*

A clearly written guide to the application of time series with SAS/ETS software. The manual starts with examples of linear regression and autoregression models and then goes on to more complex topics, including the ARIMA model, state space models, spectral analysis, and cross-spectral analysis. Numerous examples throughout the manual are effective in illustrating this advanced statistical topic.

### Technical Reports

*P-145 — SAS Macro Facility Features*

Provides a description of the Version 6 macro facility for SAS/PC, including macro variables, macro functions, and macro programming statements. (Note that the SAS macro facility for micros is not yet so devel-

continued...

oped as the one for mainframes: for example, there are no conditional (%IF) nor looping (%DO) statements.) This version has sufficient power to store and retrieve SAS jobs that must accommodate changing details.

*U-105 — A Guide to the SAS Usage Notes and Sample Library, Version 6*

Provides a description of two facilities distributed with SAS/PC. The SAS Usage Notes list currently known problems and common user misunderstandings for all SAS software products. The SAS Sample Library contains SAS programs that illustrate techniques for using the SAS System. This technical report is written with a SAS consultant in mind, but a user may benefit from it also.

These publications are available for reference at the UTCS Information Office, Room 206, Engineering Annex. Personal copies can also be ordered through the Information Office.

## A New Noncredit Short Course — SASPC201

*Joyce Bernstein*
JBERNST at UTORONTO

A new short course, SASPC201 — Intermediate Applications of SAS on the IBM PC, was introduced by UTCS in May. The main course objectives are: to be able to select an appropriate SAS procedure for regression, ANOVA, or multivariate analysis; to code command statements for basic models; and to interpret the resulting output.

This course assumes a basic knowledge of the SAS/PC package at the level of the SASPC101 course, including such topics as temporary and permanent SAS data set creation and manipulation, use of basic SAS procedures such as PROC PRINT and PROC SORT, and a working knowledge of the SAS Display Manager. Each of the five sessions is a two-hour combination of lecture periods and a hands-on workshop during which problems suggested by the instructor can be tried and discussed.

The topic for *Day 1* is formatted input and output, including PROC FORMAT, SAS Formats and Informats, PUT and FILE statements, and pointer controls. Special data step features are discussed during the first hour of *Day 2*; this includes ARRAYs and DO statements, along with some special SAS functions.

The second hour of *Day 2* serves as an introduction to analyzing experimental design data in SAS. Techniques for examining the validity of frequently encountered mathematical assumptions are explored using PROC UNIVARIATE and PROC PLOT. In addition, the use of paired and unpaired T-tests is discussed.

*Days 3* and *4* are devoted to a variety of experimental design applications. Beginning with a simple one-way analysis of variance, examples of increasingly complex models are presented, including nested data, factorial designs, repeated measures analyses, and multivariate ANOVA, with the emphasis on the use of the SAS language and interpretation of the output. Examples using both PROC ANOVA and the elusive PROC GLM will be used, including a comparison of these techniques.

The topic for the final day is regression analysis in SAS. This includes various methods for stepwise analysis available in PROC REG, polynomial regression, and the use of PROC GLM for analysis of covariance and weighted least squares.

While some background in theoretical and/or applied statistics would be useful for those attending the course, it is not essential. The emphasis will be on application of the above methods, and not on statistical details. For more information regarding SASPC201, please call me at 978-5128. To register for this or other UTCS short courses, phone the Education Coordinator at 978-4565.

## Recent Updates to Statistical Software

*Dr. Bill Fehlner*
FEHLNER at UTORONTO

Over the past five months, new versions or releases of several statistical software packages have been put into user test on both MVS and CMS. The Software List at the back of *ComputerNews* has been updated from issue to issue to reflect these changes. This article will list new versions now in test, point out sources for detailed information on the changes in each product, and provide a schedule for retiring the older versions. In general, older versions will be removed in

**Recent Updates to Statistical Software** continued

September 1987, or as soon thereafter as possible. In the meantime, instructors should be incorporating the latest version of a product in their course plans, and researchers should be testing their programs. Members of the SNAC Group are available for consultation on these conversion efforts.

### SAS

SAS 5.16 was put into user test on both MVS and CMS in March. SAS 5.08 and SAS 5.15 are no longer available. SAS 82.4 on MVS and SAS 82.3 on CMS are still the production versions, but they are scheduled for removal on September 1. Note that the micro-to-mainframe link (RLINK) is functional with SAS 5.16 on both MVS and CMS. PROC BMDP works with any of the versions of BMDP on MVS or CMS.

An article in the March issue of *ComputerNews* contains a summary of changes and enhancements to SAS 5.16 in comparison with Version 5.08. A full description of these enhancements is contained in the *SAS Institute Technical Report: P-146.*

### SPSS$^x$

Version 2.2 of SPSS$^x$ was put into user test on both MVS and CMS in May 1987. SPSS$^x$ 2.1 will remain the production version on both MVS and CMS until its scheduled removal on September 1.

The SPSS$^x$ TABLES procedure was added to both SPSS$^x$ 2.1 and 2.2 on CMS in May. It extends SPSS$^x$ to produce high-quality tables from system datasets created within SPSS$^x$.

An updated version of LISREL was put into user test with SPSS$^x$ on the MVS system in May.

A summary of changes and enhancements to SPSS$^x$ 2.2 in comparison with Version 2.1 appears separately (see next article). A full description of these enhancements can be obtained with the INFO command from within SPSS$^x$ 2.2. A printed copy of the output from the INFO command is available for reference at the UTCS Information Office (Room 206, Engineering Annex). An article in the May/June issue of *ComputerNews* compares SPSS$^x$ TABLES with PROC TABULATE in SAS.

### BMDP

The 1985 version of BMDP was released for test on MVS in June 1986 and became the production version in July of that year. The 1985 version was released for user test on CMS in May 1987 and will become production in September. The 1987 version of BMDP will be available for user test on MVS in August. The 1987 version will not be released for CMS by BMDP Inc. until late in the fall. Thus in September 1987, BMDP '85 will be production on both MVS and CMS, and BMDP '87 will be in test on MVS.

An article summarizing the changes in BMDP '85 compared with BMDP '83 appeared in the May/June 1986 issue of *ComputerNews.* An article on new features in BMDP '87 will appear in the September 1987 issue. The *BMDP Data Manager Manual*, available from BMDP Inc., describes the interactive data manager, a new feature in BMDP '87 on both MVS and CMS.

### Summary

All written documentation mentioned above is available for reference in the UTCS Information Office (Room 206, Engineering Annex). Personal copies of vendor-supplied manuals can be ordered.

Please call 978-HELP with your questions on conversion efforts or to set up an appointment to discuss these new software products.

## Changes and Enhancements in Release 2.2 of SPSS$^x$

*Dr. A. Pindor*
APINDOR at UTORONTO

SPSS$^x$ 2.2 is now available for user test on both MVS (GPJS) and CMS (UTORONTO) as well as CMS on UTOREPAS. On September 1, it will become the production version, and Release 2.1 will be phased out. In the meantime, users are encouraged to acquaint themselves with Release 2.2 and take advantage of its additions and enhancements.

The following facilities are new in Release 2.2:

* The RENAME VARIABLES command enables you to change the names of variables in the SPSS$^x$ active file.
* The AUTORECODE command allows you to recode values from one variable into consecutive integers and then store the new values in another variable. The original values become value labels. (Issue the INFO AUTORECODE command for more information.)
* The DROP DOCUMENTS command allows you to remove documents from SPSS$^x$ system files.
* The INCLUDE command lets you include a file of SPSS$^x$ commands in a run by providing the file handle of the the included file.
* The XSORT subcommand on SET permits you to specify whether you wish to use the sort program built into SPSS$^x$ or the default sort program on your system.
* The XSORT subcommand on SHOW allows you to see which sort program your job will use by default.

These facilities were available prior to Release 2.2, but have been changed:

* There are new rules governing reference to scratch variables after the TEMPORARY command.
* There are new restrictions on the VALUE LABELS and ADD VALUE LABELS commands.
* There are new rules for defining missing values.
* The XTOPC and PCTOX jobs, for translating SPSS$^x$ and SPSS/PC+ command files, are no longer available.

A number of procedures have also been modified or enhanced:

* Several modifications affect saturated models in procedures HILOGLINEAR and LOGLINEAR.
* A large number of improvements have been made to MANOVA:
    - Simplification of syntax and output.
    - Green-Geisser and Huyn-Feld epsilons along with the associated corrected averaged F-tests for repeated measures.
    - Replacement of the Bartlett test of sphericity by the more appropriate Mauchly test in repeated-measures designs.
    - Collinearity diagnostics for design matrices based on a singular value analysis taken from Belsley, Kuh, and Welsch.
    - Exact linear combinations of parameters that form a redundancy.
    - Methods for assessing effect size, including measures of univariate and multivariate eta square, univariate R square, and Hay's omega square.
    - Observed power for univariate and multivariate significance tests. Both approximate and exact methods are included.
    - Simultaneous univariate Scheffe and Bonferroni confidence intervals and simultaneous multivariate confidence intervals for parameter estimates.

**Changes and Enhancements** continued

  - Optimal Scheffe contrast coefficients for each effect.

  - Ability to use QR with observations models.

* Output of the REPORT procedure has been improved.

* Procedure TABLES has been enhanced.

More details about these and other features of Release 2.2 of SPSS$^x$ can be obtained online using the INFO command. INFO FACILITIES gives a detailed description of changes to facilities. It produces approximately 500 lines of output. INFO <procedure-name> describes the changes to a specific procedure. INFO PROCEDURES is a short form to get information on all procedures at once. It generates about 2200 lines of output. A printed copy of the INFO output is available for reference in the Information Office (Room 206, Engineering Annex).

Anyone with problems or questions about SPSS$^x$ 2.2 should phone Advising Services at 978-HELP.

## ProComm Communications Program Seminar

September 10, 1987
1:00 - 3:00 p.m.

ProComm is a general purpose communications program currently available to all U of T faculty, staff, and students. ProComm is the resident communications program in the Education Facility.

A seminar has been scheduled to introduce ProComm and its various features: terminal emulation (a number of popular ones will be reviewed); the dialing directory; file transfer protocols, such as Kermit and XMODEM; command files to control automatic logon and unattended operation; and the DOS gateway, which allows you to execute DOS commands and other programs while you are still in ProComm.

The seminar is free of charge; copies of ProComm are also made available at no charge, but you must bring your own diskettes.

To reserve a place in this seminar, please phone me at 978-4565.

*Irene Rosiecki*
ROSIECKI at UTORONTO

## Free NetNorth (Electronic Mail) Demonstration

September 10, 1987
11:00 - 12:00 noon

Anyone interested in sending documents to colleagues or friends reliably, quickly, and inexpensively will not want to miss this demonstration. We will introduce you to the NetNorth/BITNET/EARN communications network, which is accessible from the CMS system. This network connects more than a thousand universities and research institutes in Europe, Asia, and North America. Sending documents or files over the network is very simple and is easy to learn.

The demonstration will last just under an hour. Included will be how to send mail and files to another institution and how to talk directly to someone on the network.

Space is limited. If you would like to attend, please contact me at 978-4565 to reserve a place.

*Irene Rosiecki*
ROSIECKI at UTORONTO

# The UTCS Tape Library

*Bob Chambers*

### Introduction

The UTCS Tape Library houses the many thousands of tapes used on the computer systems in the UTCS Machine Room. Two categories of tapes exist: UTCS-owned tapes, which users may reserve for their own use, and user-owned tapes, which have been placed in the library at the request of users.

*A UTCS-owned tape*, sometimes referred to as a "native" or an "N" tape, has an external (or visual) label of the form Nxxxx, where xxxx is a 4-digit number. The same number is also magnetically recorded. This label is written in IBM Standard Label format and is also known as the volume serial number, or "volser" for short. UTCS-owned tapes cannot be removed from the Tape Library.

*A user-owned tape* may be deposited in the UTCS Tape Library in one of two sublibraries: the F (foreign) library, or the BN library.

Tapes placed in the F sublibrary are assigned a slot number of the form Fxxxx, where xxxx is a 4-digit number. This is also used as the tape's external label. To avoid potential confusion, users must not use internal labels of the form Fxxxx.

The BN sublibrary is specifically designed for the UTCS VM/CMS service (though BN tapes can be used on other systems as well). On VM/CMS, tapes are provided additional security, and users are allowed to submit online queries regarding the status of tapes.

These libraries are managed by the UTCS Tape Librarian, who can be contacted in person in Room 368 of the McLennan Labs, or by phone at 978-7319 between 08:45 and 17:00 (08:45 and 16:30 during July and August), Monday through Friday.

### Reserving a UTCS-owned Tape (an N Tape)

To reserve a UTCS-owned tape, you must contact the UTCS Tape Librarian and supply the following information:

- the tape density (either 6250 or 1600 bpi)
- which computer or systems the tape will be used on
- a UTCS Customer Account Number (CAN)
- the name of the CAN owner
- your name, address, and phone number

The Tape Librarian will then assign a tape number of the form Nxxxx, where xxxx is a 4-digit number.

### Reserving an F-Tape Slot for a User-owned Tape

To reserve an F-tape slot to hold a user-owned tape, you must contact the UTCS Tape Librarian and supply the following information:

- which computer or systems the tape will be used on
- a UTCS Customer Account Number (CAN)
- the name of the CAN owner
- your name, address, and phone number

The Tape Librarian will then assign you a tape slot number of the form Fxxxx, where xxxx is a 4-digit number.

### Depositing or Removing F Tapes

When the Tape Librarian is on duty (see hours above), users should contact her to have a tape placed in or removed from an F slot. However, between 07:00 and 08:45 Monday through Friday and between 17:00 and 22:00 (16:30 and 22:00 in July and August) Monday through Thursday, users may request this service at the I/O window next to Room 368 in the McLennan Labs. The following information should be provided:

- the F-slot number of the form Fxxxx
- which computer or systems the tape was or will be used on
- a UTCS Customer Account Number (CAN)
- the name of the CAN owner
- your name, address, and phone number

Please note that if you want to place a tape in the library in the early morning or the evening hours stated above, you must already have an F-slot number for your tape. During the hours a Tape Librarian is not on duty, it is not possible to issue slot numbers for any kind of tape.

continued...

**UTCS Tape Library** continued

### Reserving BN Tapes and Removing BN Tapes

The BN tape sublibrary is integrated with tape-management software. Because of this, tape characteristics must be recorded in an online catalogue when a BN slot number is assigned. Thus, assigning a slot number and placing a tape in the BN sublibrary are done together. Similarily, when removing a tape from a BN slot, the slot number is also removed. All transactions involving the BN sublibrary must be handled by the Tape Librarian. The information you must supply is as follows:

- a BN tape slot number of the form BNxxxx
- which computer or systems the tape was or will be used on
- a UTCS Customer Account Number (CAN)
- the name of the CAN owner
- your name, address, and phone number

When you place a tape in the library, the Tape Librarian will assign you a tape slot number of the form BNxxxx, where xxxx is a 4-digit number.

### Adding or Removing a Write-protect Red Tape Seal

If write protection is desired, you can arrange through the Tape Librarian to have an N, F, or BN tape banded with a red tape seal. An operator mounting a tape with a red seal will not insert a write ring, regardless of what the mount request has specified. To have a red seal placed on or removed from a tape, you must contact the Tape Librarian either in person in Room 368 of the McLennan Labs or by telephone during the hours stated above. The Tape Librarian will request the following information:

- the N, F, or BN tape or tape slot number
- a UTCS Customer Account Number (CAN)
- the name of the CAN owner
- your name, address, and phone number

## Printing Services Rate Change

*Ron Vander Kraats*
RVK at UTORONTO

Rates for printing services at UTCS increased on August 1. Although rates have been decreasing for many of our machine-based services, rising costs have forced us to raise the price of printing on the Xerox 8700 Laser Printer and the IBM 1403 Impact Line Printer. This is the first rate adjustment on these services since 1984.

The rate for the default form (2-up, duplex) on the laser printer will rise from 2.3 cents to 3.2 cents per page. Other 8700 forms codes will increase by a similar percentage. On the line printer, the cost of printing a page with the default forms code will increase from 10 cents to 15 cents. Other 1403 forms codes will be subject to a similar increase. The mount charge will remain the same.

A revised Rate Schedule can be obtained from Accounting Services, (Room 337, McLennan Labs) or by calling 978-8703.

## Charge for Files in VM/CMS Reader

*Ron Vander Kraats*
RVK at UTORONTO

A daily charge for data in VM/CMS account Readers has been in effect since May 1. The charge for internal accounts is one cent per 200 records per day, with no charge for the first 500 records, and no charge for the first day that a file resides in the Reader. This charge covers all files in the Reader, including mail sent by other users.

UTCS encourages all users to check and clean out files in their Readers regularly. Your cooperation will allow for the best use of the public disk space, where all Reader files reside.

## MVS Pascal Change

*Herb Kugel*
HERB at UTORONTO

UTCS has thus far had two Pascal compilers available under MVS, both at the Class C level of support, but this has not proved practical. Effective August 10, we removed the University of Waterloo Pascal, leaving only the Australian Atomic Energy Commission Pascal, at a Class C level of support. However, this change will not affect Pascal under VM/CMS.

# UTCS Noncredit Computer Courses

*Irene Rosiecki*
ROSIECKI at UTORONTO

In order to meet our users' growing needs for microcomputers in everyday applications, UTCS has developed new courses dealing with both the IBM PC and compatibles and the Apple Macintosh. All UTCS courses are hands-on and are usually offered on an ongoing basis, usually every 4-6 weeks.

To provide each student with a microcomputer during the course, class size is kept to a minimum. Registration is handled on a first-come,'first-served basis.

Additional courses (Lotus 1-2-3, dBASE, and Desktop Publishing) are still in development but are expected to be available in October. For a complete list of UTCS computer courses (both mainframe and microcomputer), and to find out about course fees, please contact:

UTCS Education Office
11 King's College Road
Room 207
Phone: 978-4565

Listed below are our course offerings for August and September:

**CONIBM101 - Microcomputer Concepts (IBM)**

This hands-on seminar lays the foundations for using an IBM-oriented microcomputer. It is designed for people who have never touched a computer (and might be afraid to do so), but those already acquainted with micros will also benefit. The seminar explains basic computer jargon, describes the parts of a microcomputer, and shows how they interact to let you use the computer for your own work. You will have an opportunity to use an IBM PC while you learn how your information is put into the computer, how it is organized and stored there, and how to retrieve and work with it.

*Topics:* hardware components; disks; computer memory and data storage; running programs; kinds of programs; files; applications on a PC (e.g., word processing, database management).

Prerequisite: None.

Date: September 11, 1987
Time: 1:00 - 4:00 p.m.

**CONMAC101 - Microcomputer Concepts (Macintosh)**

This hands-on seminar lays the foundations for using an Apple Macintosh microcomputer. It is designed for people who have never touched a computer (and might be afraid to do so), but those already acquainted with micros will also benefit. The seminar explains basic computer jargon, describes the parts of a microcomputer, and shows how they interact to let you use the computer for your own work. You will have an opportunity to use a Macintosh while you learn how your information is put into the computer, how it is organized and stored there, and how to retrieve and work with it.

*Topics:* hardware components; using the mouse; functions of disks; computer memory and data storage; running programs; kinds of programs; documents and folders; applications for the Macintosh (e.g., word processing, graphics).

Prerequisite: None.

Date: September 9, 1987
Time: 1:00 - 4:00 p.m.

**DOS101 - Introduction to DOS**

This hands-on course covers the most important features of the Disk Operating System (DOS), Version 3.20, which is used on IBM PCs and compatibles. You will learn commands necessary for proper file management and data protection. A basic acquaintance with IBM microcomputer concepts is assumed (you should be familiar with, for example, hardware components, computer memory, and the function of disks, files, and directories).

*Topics*: formatting disks; file-naming conventions; commands for copying, deleting, and renaming files; paths and the directory hierarchy; write-protecting and backing up data; estimating space requirements.

Prerequisite: CONIBM101 or equivalent experience on an IBM-oriented microcomputer.

continued...

Date: September 21-25, 1987
Time: 9:00 - 11:00 a.m.

**MSWORD101 - Introduction to Microsoft Word**

This course gives the student a thorough knowledge of the basic use of the Macintosh, and some of the editing and formatting capabilities of Microsoft Word, Version 3.0. Extensive hands-on practice of the material taught is provided.

*Topics:* introduction to the Macintosh; keyboard layout; text editing and formatting (letters, memos); preparation of simple reports (excluding complex tabular material); simple research papers and articles including footnotes.

Date: August 24-28, 1987
Time: 1:00 - 4:00 p.m.

Date: September 21 - 25, 1987
Time: 1:00 - 4:00 p.m.

**SASCMS101 - Introduction to SAS and CMS**

This course teaches new users how to access computer facilities interactively using fullscreen CMS and how to do basic data analysis using the SAS package.

Users will learn to create, modify, use, and delete data files with the XEDIT and FILELIST facilities on CMS. Using SAS, students will learn to produce descriptive statistics, display data in charts and plots, and prepare data for more detailed statistical analysis. SAS programs will be run within CMS.

*Topics:* basic concepts required to work with the CMS system; management of data files using FILELIST on CMS; editing of files using XEDIT; preparation, submission, and retrieval of jobs; descriptive statistics; definition of terms (variables, observations, and missing values); data cleaning.

This is a hands-on course. The student must provide a Customer Account Number (CAN) at the time of registration so that a student account on VM/CMS can be set up.

Date: September 28-October 9, 1987
Time: 1:00 - 3:00 p.m.

**SASPC101 - Introduction to SAS on the IBM PC**

This course is an introduction to SAS on a microcomputer. It is aimed specifically at new SAS users. Students will be assigned individual micros for the combination lecture/workshop sessions.

*Topics:* introduction to the SAS language in the DOS environment; using the display manager; online help; introduction to SAS data sets; more advanced data set manipulation; introduction to SAS procedures; use of various SAS procedures for exploratory data analysis and presentation; creating and using permanent SAS data sets.

Date: September 14 - 18, 1987
Time: 12:00 - 2:00 p.m.

**SASPC201 - Intermediate Applications of SAS on the IBM PC**

This course focuses on some of the more advanced data set features and statistical procedures included in SAS under PC DOS. The prerequisite knowledge required is at the level of the material covered in SASPC101. While some background in applied statistics would be helpful, it is not essential; the emphasis of the course is the SAS language and not statistical theory. Each session is a combination of lectures and hands-on practice with sample problems.

*Topics:* SAS Formats and Informats; Pointer controls; DO loops; arrays; special SAS functions; testing experimental assumptions (PROCs UNIVARIATE and PLOT); T-tests in SAS (independent and paired); use of PROCs CORR, ANOVA, GLM, and REG in a variety of applications, including one-way analysis of variance, multiple comparisons, factorial designs, MANOVA analysis of covariance, methods of stepwise regression, repeated measures designs, and partial correlation analysis.

Each procedure is examined in the context of sample data. The discussion will concentrate on types of situations which SAS can handle, the options available, and the interpretation of output.

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**UTCS Noncredit Courses** continued

Prerequisite: SASPC101 or equivalent basic knowledge of SAS under PC DOS.

Date: August 24-28, 1987
Time: 11:00 - 1:00 p.m.

**WRDPERF102 - Introduction to Administrative WordPerfect**

This introductory WordPerfect course is intended for both beginners and experienced microcomputer users who want to learn the editing and formatting capabilities of WordPerfect. The course is designed to meet the needs of department secretaries and administrators using WordPerfect in their jobs.

*Topics:* introduction to microcomputers; the IBM-PC keyboard and WordPerfect template; text editing; formatting commands; tabs and tables; document printing options; Extended ASCII characters; spell-checker program; various WordPerfect options.

Date: September 14-18, 1987
Time: 9:00 - 12:00 noon

**WRDPERF302 - Advanced Administrative WordPerfect Topics**

This advanced course is intended for those already using WordPerfect who would like to familiarize themselves with special WordPerfect topics. It is tailored to participants' requests at the beginning of the course.

*Topics:* macros; convert utility; merging; mailing lists; sorting; outlines; tables, indexes, and various lists.

Prerequisite: WRDPERF102 or equivalent experience with WordPerfect.

Date: September 21-25, 1987
Time: 11:00 -1:00 p.m.

## Personnel Changes

**Terry Sanderson** has joined the Microcomputer Support Group as Micro Support Specialist.

**Dariusz Dabek** has joined Advising Services as a Consultant.

**Reinhard Schuller** has joined Advising Services as Senior Consultant and Supervisor.

**Karl Hinds**, from Operations, has left UTCS to continue his education.

**Hung Thanh Chu**, from Operations, has left to further his career.

**Louise Hunt**, the Communications Assistant from Communications and Technical Support, has left to continue her career in London, Ontario.

**UNIVERSITY OF TORONTO**
**COMPUTING SERVICES (UTCS)**
**Hours of Service**
Labour Day (September 5,6,7)

The hours of service for the above holiday weekend will be announced via system Broadcast and HOTNEWS messages closer to the holiday.

# Change Committee

*Beverly Scarborough*
BEVS at UTORONTO

### Changes to Academic MVS Machine Services

1. Version 2.0 of SPSS$^x$ was removed (May 21).
2. SPSS$^x$ 2.2 and LISREL were installed on MVS for user test (May 28).
3. BMDP '85 was installed on CMS for user test (May 28).
4. SPSS$^x$ 2.2 was installed on CMS for user test (May 28).
5. PL/I 1.4.0 was removed from BACKUP libraries (June 2).
6. APL went under Class C support (June 1).
7. A logon screen for VM/VTAM was provided (June 10).
8. A trailer page for VM carrying the disclaimer "ALL CHARGES AT INTERNAL RATES" was implemented (June 5).

### Changes to Academic VM/CMS Machine Services

1. VMBLIST became production (June 4).
2. SPSS$^x$ TABLES was installed (May 14).
3. WATFOR-77 Version 1.5 was installed as NEW (June 2).
4. SYNCSORT 5.2 (E) was installed as production SORT (June 2).
5. Pascal 2.1 was removed from OLD libraries (June 2).
6. C 1.2 was removed from OLD libraries (June 2).
7. PL/I 1.4.0 was removed from BACKUP libraries (June 2).

### Changes to Other Systems and Services

1. JNET was updated to 3.1 on the MVAX (May 11).

# Documents at UTCS

All vendor-produced documentation may be ordered through the UTCS Information Office, Room 206, Engineering Annex. UTCS documents and selected vendor documents are also stocked there for purchase. For more information on prices, call Dale Wright at 978-4990. Whenever feasible, documents are made available online, and users are encouraged to print their own copies. On the MVS and VM machines, special commands have been provided for this purpose.

To print online documents on:

| **IBM MVS** | **IBM VM/CMS** | **GP UNIX** |
|---|---|---|
| WYLBUR users type "do document?" | Type "help document" | Use *ipr* command |
| TSO users type "help document" | | |
| APL users type ")LOAD 1 UTCSGUIDE<RETURN>HELP" | | |

In these examples, the document to be printed is the UTCS Guide to Census Tapes (MANUAL/LISTING=CENSUS).
<RETURN> means RETURN or ENTER key.

| | |
|---|---|
| **TSO:** | document census forms(yxle) <RETURN> |
| **WYLBUR:** | do document <RETURN> and respond to the prompts. |
| **CMS:** | document <RETURN> <RETURN><br>laser census listing (forms yxle <RETURN> |
| **GP UNIX:** | nohup ipr -8p -fyxle /usr/doc/utcs/census & <RETURN> |

**UTCS Documents in hardcopy:**

**New:**

**Previously announced:**

- Academic's Guide to Microcomputer Systems
- Character Sets for Highspeed Printing
- UTCS GUIDE TO PRODUCTS AND SERVICES: Introduction
- UTCS GUIDE TO PRODUCTS AND SERVICES: Basics
- UTCS GUIDE TO PRODUCTS AND SERVICES: Accounting
- UTCS Catalogue: Access, Part 1
- UTCS Catalogue: Access, Part 2
- UTCS Catalogue: IBM MVS Utilities
- UTCS Catalogue: Numerical Products
- UTCS Catalogue: Statistics Products
- UTCS Catalogue: Text Products
- UTCS Guide to Census Tapes
- UTCS Guide to Tape Usage on VM/CMS
- UTCS Guide to Kermit
- UTCS Guide to Micro File Transfer Service
- UTCS Guide to Text Processing on GP UNIX

| **UTCS Documents online** | **MVS MANUAL** | **CMS LISTING** | **GP UNIX** | **Forms Code** |
|---|---|---|---|---|
| **New:** | | | | |
| **Previously announced:** | | | | |
| UTCS GUIDE TO PRODUCTS AND SERVICES: Introduction | INTRO | INTRO | /usr/doc/utcs/intro | * |
| UTCS GUIDE TO PRODUCTS AND SERVICES: Basics | BASICS | BASICS | /usr/doc/utcs/basics | * |
| UTCS Catalogue: Access, Part 1 | ACCESS1 | ACCESS1 | /usr/doc/utcs/access1 | * |
| UTCS Catalogue: Access, Part 2 | ACCESS2 | | /usr/doc/utcs/access2 | * |
| UTCS Catalogue: IBM MVS Utilities | MVSUTIL | MVSUTIL | | * |
| Product-Function List | UTILLIST | UTILLIST | | BXQD |
| UTCS Catalogue: Numerical Products | NUMCAT | NUMCAT | | * |
| Product-Function List | NUMLIST | NUMLIST | | BXQD |
| UTCS Catalogue: Statistics Products | STATCAT | STATCAT | | * |
| Product-Function List | STATLIST | STATLIST | | BXQD |
| UTCS Catalogue: Text Products | TEXTCAT | TEXTCAT | /usr/doc/utcs/textcat | * |
| UTCS Guide to BMDP | BMDP | BMDP | | * |
| UTCS Guide to Census Tapes | CENSUS | CENSUS | /usr/doc/utcs/census | * |
| UTCS Guide to GP UNIX | | | /usr/doc/utcs/gpunix | * |
| UTCS Guide to GPJS | GPJSX | GPJSX | /usr/doc/utcs/gpjs | * |
| UTCS Guide to Highspeed Printing | PRINT | PRINT | /usr/doc/utcs/print | * |

* *Recommended forms code for the 8700 is YXLE unless otherwise stated.*
△ *Use the 87set command. Type "help 87set".*

## Documents continued

| UTCS Documents online | MVS MANUAL | CMS LISTING | GP UNIX | Forms Code |
|---|---|---|---|---|
| **New:** | | | | |
| **Previously announced:** | | | | |
| UTCS Guide to IBM MVS Online Storage | IBMDISK | IBMDISK | | * |
| UTCS Guide to Kermit | KERMIT | KERMIT | /usr/doc/utcs/kermit | * |
| UTCS Guide to Micro File Transfer Service | MICROXFR | MICROXFR | | * |
| UTCS Guide to Micro Laser Printing | MICRLASR | MICRLASR | | * |
| UTCS Guide to SAS | SAS | SAS | | * |
| UTCS Guide to SCRIBE | | SCRIBE | | * |
| (For printing instructions, see page 1 of document) | | | | |
| UTCS Guide to Series/1 Terminal Use | SERIES | SERIES | | * |
| 3270 Emulation: | | | | |
| Cybernex APL100 and Volker Craig VC404 | CYBER | CYBER | | * |
| DM1520 | DM1520 | DM1520 | | * |
| Hardcopy Terminal | HARDCOPY | HARDCOPY | | * |
| IBM 3101 | IBM3101 | IBM3101 | | * |
| IBM PC Kermit | PCKERMIT | PCKERMIT | | * |
| SOROC IQ | SOROC | SOROC | | * |
| VT52 | VT52 | VT52 | | * |
| VT100 | VT100 | VT100 | | * |
| UTCS Guide to SPSS | SPSS | SPSS | | * |
| UTCS Guide to SUBUTILS | SUBUTILS | SUBUTILS | | * |
| UTCS Guide to Tape Usage on VM/CMS | | CMSTAPE | | * |
| UTCS Guide to Text Processing on GP UNIX | | | /usr/doc/utcs/text | * |
| UTCS Guide to TFW.MAK in SCRIBE | | TFWMAK | | * |
| UTCS Guide to TSO | TSOGD | | | * |
| UTCS Guide to UTDSUTIL | UTDSUTIL | UTDSUTIL | | * |
| UTCS Guide to VM/CMS | CMSGD | CMSGD | | * |
| UTCS Guide to WYLBUR | WYLINTRO | | | * |
| UTCS Rate Schedule (Commercial) | | RATESCOM | | Δ |
| UTCS Rate Schedule (External) | | RATESEXT | | Δ |
| UTCS Rate Schedule (Internal) | | RATESINT | | Δ |
| UTCS WYLBUR Tutorial | WYLTUTOR | | | * |
| **Other Documentation online** | | | | |
| *Kermit* | | | | |
| Kermit Protocol Manual | KERMITPM | KERMITPM | | YXOE |
| Kermit User Guide | KERMITUG | KERMITUG | | YXOF |
| *ProComm Reference Manual* | PROCOMM | PROCOMM | | YXOE |
| *VM Tape Documents* | | | | |
| TapeMap User's Guide and Reference | | TAPEMAP | | * |
| VMTAPE Messages and Codes | | VMTMSGS | | YXOE |
| VMTAPE User's Guide | | VMTUSER | | YXOE |
| *VMSECURE* | | | | |
| VMSECURE User's Guide | | VMSECURE | | YXOE |
| *Waterloo SCRIPT* | | | | |
| Reference Manual | WSCRPTRF | WSCRPTRF | | YXLC |
| User's Guide | WSCRPTUG | WSCRPTUG | | YXLC |
| Using SCRIPT in MVS/TSO | WSCRPTSO | WSCRPTSO | | YXLC |
| Waterloo SCRIPT and a PostScript Printer | WSCRPTPST | WSCRPTPS | | YXLC |
| Formula Processor Summary | WSCRPTFP | WSCRPTFP | | YXLC |
| GML User's Guide | GMLUG | GMLUG | | YXLC |
| GML Reference Summary | GMLRFSUM | GMLRFSUM | | YXLC |
| *OBS WYLBUR* | | | | |
| Messages and Codes | WYLMSGS | | | YXLD |
| Qwik Files | WYLQWIK | | | YXLD |
| Reference Summary | WYLREFCD | | | YXLG |
| Reference Manual | WYLREFMN | | | YXLD |
| 7.0 Release Guide | WYLREL70 | | | YXLC |
| User Guide | WYLUSER | | | YXLD |
| *Electronic Mail* | | | | |
| A User's Guide to Electronic MAIL | | MAILBOOK | | YXLD |

** Recommended forms code for the 8700 is YXLE unless otherwise stated.*
*Δ Use the 87set command. Type "help 87set".*

## Consulting and Enquiries

| | | | |
|---|---|---|---|
| Applications Support & Advising Supervisor | Alex Nishri | KC308 | 978-7109 |
| External Marketing Consultant | Ihor Prociuk | KC308 | 978-6875 |
| Erindale College | Joe Lim | ER2035 | 828-5311 |
| Scarborough College | William Barek | SC626 | 284-3173 |
| Information Office | Dale Wright | EA206 | 978-4990 |
| Account & Access Code Enquiries (U of T) | tba | MP337 | 978-8703 |
| Account & Access Code Enquiries (External) | Sylvia May | MP337 | 978-7148 |
| IBM PC Maintenance | Kam Mark | SF4306 | 978-5050 |
| Tape Library (Academic Services) | Rosa Ciddio | MP368 | 978-7319 |
| Tape Library (Administrative Services) | Miranda Fong | MP368 | 978-6693 |
| Terminal Rentals | tba | SF4306 | 978-3787 |
| U of T Computer Library | Stephanie Johnston | EA206 | 978-2987 |
| UTCS Noncredit Short Courses | Irene Rosiecki | EA207 | 978-4565 |

| | |
|---|---|
| Consulting & Advising Services: | 978-HELP |
| CMS, TSO and GP UNIX userids: | ADVISOR |
| CMS Userid for mail problems: | POSTMSTR |
| System Status Enquiries (GP UNIX) | 978-4318 |
| System Status Enquiries (IBM) | 978-7393 |
| Interactive Services 300 (bps) | 978-6200 |
| Interactive Services 1200 (bps) | 978-3959 |
| Interactive Services 2400 (bps) | 978-7239 |
| Datapac | 4320 0056 |
| Telnet | 0302043200056 |
| Tymnet | <backspace>DPAC;302043200056 |

## UTCS Directory

| | | | | |
|---|---|---|---|---|
| **Director:** | Dr. Warren Jackson | MP350 | 978-8948 | WCJ at UTORONTO * |
| **Associate Director:** | Eugene Siciunas | MP350 | 978-5058 | EUGENE at UTORONTO * |
| **Managers:** | | | | |
| Communications & Technical Support | Norman Housley | SF4306 | 978-4967 | NORMAN at UTORONTO * |
| Internal Systems & Administration | Ron Vander Kraats | MP350 | 978-4428 | RVK at UTORONTO * |
| Operations | Dr. Bob Chambers | MP350 | 978-7092 | |
| Systems | Bill Lauriston | MP331 | 978-3579 | BILL at UTORONTO * |
| User Interface | Don Gibson | KC308 | 978-7331 | DON at UTORONTO * |

## Committees on Computing

| | | | | |
|---|---|---|---|---|
| Committee on Administrative Computing | Chair | Janice Oliver | 978-4322 | |
| Research Board Standing Committee on Computing | Chair | Prof. C.C. Gotlieb | 978-2986 | |
| UTCS Board | Chair | Prof. D.M. Nowlan | 978-4984 | NOWLAN at UTORONTO * |
| Supercompter Users' Group at U of T | Chair | Prof. P.P. Kronberg | 978-4971 | |

**Legend**
**ER** = Erindale
**SC** = Scarborough
**KC** = Koffler Centre
**MP** = McLennan Physical Labs
**SF** = Sandford Fleming

* NetNorth/BITNET/EARN

# UTCS Terminal and Advising Sites

**Names and Locations**

**Central Advising Office (CAO)**, 978-HELP
**Engineering Annex (EA, CDF)**, 11 King's College Road, Rooms 103, 107, 107B, 201, 203
**Erindale College (Erin)**, 828-5339, Mississauga Road, Erindale Campus, Rooms 2005, 2039, 2045
**Robarts, Robarts Library**, 130 St. George St., Room 1061A
**Scarborough College (Scar)**, 284-3122, Military Trail, Scarborough Campus, Rooms S624, S625, S627, S628, S628A
**Sidney Smith (Sidney)**, 100 St. George St., Rooms 1071, 1073, 2105
**St.Michael's College**, 121 St. Joseph St., Room 107
**Trinity College**, 6 Hoskins Ave., Room 024
**Victoria University**, 73 Queens Park Cres.

| Sites | Hours of Access | | | | Restrictions* | Advising |
|---|---|---|---|---|---|---|
| | **Mon-Thurs** | **Fri** | **Sat** | **Sun** | | |
| **CAO** | 10:00-18:00 | 10:00-18:00 | closed | closed | Research | 978-HELP |
| **CDF** | 24 hrs | 24 hrs | 24 hrs | 24 hrs | Undergrads | No |
| **EA** | 24 hrs | 24 hrs | 24 hrs | 24 hrs | None | 978-HELP for Research |
| **Erin** (2039)Δ | 9:00-17:00 | 9:00-17:00 | 12:00-16:00 | closed | Research | Rm 2005 |
| (2045) | 24 hrs | 24 hrs | 24 hrs | 24 hrs | Undergrads | Rm 2005 |
| (235)† | 8:00-22:00 | 8:00-17:00 | closed | closed | None | Rm 2046 |
| **Robarts** | 8:30-23:00 | 8:30-18:00 | 9:00-17:00 | closed | None | 978-HELP for Research |
| **Scar** | 24hrs• | 24hrs• | 24hrs• | 24hrs• | Research | Rm S626 |
| | | | | | Undergrads | Rm S626-A |
| **Sidney** | 7:00-24:00 | 7:00-24:00 | 7:00-24:00 | 7:00-24:00 | None | 978-HELP for Research |
| **St.Michael's** | closed | closed | closed | closed | None | Arranged by College |
| **Trinity** | closed | closed | closed | closed | None | Arranged by College |
| **Victoria** | closed | closed | closed | closed | None | Arranged by College |

**Legend**

* Research includes graduates, faculty, staff.
Δ key access available.
• printers available some of the time.
† access restricted to building hours.

**Advising Hours**

| | |
|---|---|
| **CAO** | Monday through Friday, 10:00 - 18:00 |
| **Scarborough** | Monday through Friday, 09:00 - 16:30, Tuesday, 18:00 - 24:00 |
| **Erin** | Monday through Friday, 09:00 - 20:00 |

| Sites | PACX | Network Terminal Server | CMS Terminals | Printers | CDF/PC |
|---|---|---|---|---|---|
| **CDF** | Y | N | N | Y | N |
| **EA** | N | Y | Y | Y | N |
| **Erin** | Y | Y | N | Y | N |
| **Robarts** | Y | N | Y | Y | Y |
| **Scar** | Y | Y | N | Y | N |
| **Sidney** | N | Y | Y | Y | Y |
| **St.Michael's** | Y | N | N | Y | Y |
| **Trinity** | N | N | Y | Y | Y |
| **Victoria** | Y | N | N | Y | Y |

(Y=yes, N=no)

# UTCS Services

## UTCS Centrally Owned and Managed

*Systems*

**IBM MVS**

- TSO, WYLBUR, APL, Batch
- runs as a preferred guest under VM
- MVS operating system
- Xerox 8700 Laser Printing

**IBM VM/CMS**

- General Purpose Timesharing; access to NetNorth, BITNET, and EARN networks; access to CRAY X-MP
- 4381-R03 processor, 32 megabytes of memory
- CP operating system, VM/SP HPO R3.4
- CMS timesharing system, VM/SP Release 3
- RSCS spooling system, Release 3
- CRAY station Release 4

**GP UNIX**
Technical Assistance: 978-8853

- General Purpose Timesharing under SUN UNIX 3.2
- SUN 3/280, 8 megabytes of memory
- access to Linotronic typesetter
- offers a sophisticated and powerful environment for text processing
- offers a sophisticated programming environment suitable for commercial software development or testing
- full access to USENET, an electronic technical information exchange facility
- offers excellent electronic mail facilities and ability to send or receive mail from most computer networks worldwide, such as UUCPNET, ARPANET, NetNorth, BITNET, CSNET, CDNNET

*Services*

**Communications & Technical Support**
Primary Phones: 978-3787, 978-4967

- Communications Group provides communications systems, terminals, modems, data channels: consulting and installation.
- Field Service Group installs and maintains communications and computer systems, particularly IBM PCs and Micro Vaxes, on a contract basis or on a cost-per-call basis.
- provides consulting on computer systems technology and installs computer systems
- provides access between the IBM systems and machines using UNIX, VMS and other operating systems. Ethernet, Pronet, and IBM TRN technologies are used over various transmission media including optical fibre. More basic communications techniques are also used for moderate speed links.
- provides consulting on local area networking and installs LANS
- provides access to NetNorth (BITNET), the North American Universities Network; and USENET, the UNIX networking fraternity
- will provide a communications solution to department needs on a contractual basis

**User Interface Group**
Primary Phone: 978-HELP

- provides advising, consulting and documentation on:
  - command languages, including CMS, TSO, WYLBUR, JCL, and UNIX
  - high level languages, including FORTRAN, and PL/I
  - packages and libraries, including SAS, SPSS-X, BMDP, IMSL, and NAg
  - editors and formatters, including XEDIT, TSO, WYLBUR, ed, SCRIBE, nroff/troff
- provides general micro support
  - selection consulting for hardware and software
  - Micro Lab for evaluation of hardware and software
  - advice on University discounts
  - media conversion and data transfer
  - operates UTCS Microcomputer Bulletin Board System
  - offers Micro Laser Printing Service
  - offers 35mm slide production service using Polaroid Palette
  - administers Local Area Network of PCs for research use
- high quality typesetting
- installs and maintains application packages
- provides courses on the more popular services

The principle mandate of UTCS is to plan, implement, and operate facilites and "common-carrier" networks, and to plan and support divisional, departmental or project computer facilities as requested.

## Facilities Managed by UTCS

**Administrative Computing**

- administrative IMS/VS, DB/DC, DB2, Batch, and TS0
- 4381-R03 processor, 32 megabytes of memory
- MVS operating system

**Computer Disciplines Facility/VAX**

VAX-11/780, 4 megabytes of memory
VAX-11/750, 4 megabytes of memory
VAX-11/750, 4 megabytes of memory

- Computer Science interactive access
- UNIX (Berkeley UNIX 4.2BSD)

**Computer Disciplines Facility/PC**

- 97 TI Professional Computers connected in a Local Area Network
- introductory Computer Science instruction
- MS-DOS with Turing environment

**Scarborough College Systems**

SUN 3/280, 16 megabytes of memory
SUN 3/280, 16 megabytes of memory

- instructional access using UNIX (Berkeley UNIX 4.2BSD)

**Erindale College Systems**

VAX 8200, 8 megabytes of memory

- instructional access using VMS
- research access

VAX-11/750, 5 megabytes of memory

- instructional access using UNIX (Berkeley UNIX 4.2BSD)

**Institutional Relations System**

VAX-11/750, 8 megabytes of memory

- database services to the owner departments using VMS

**EPAS Facility**

- 4361-5 processor, 16 megabytes of memory
- general VM/CMS services to the owner departments

# UTCS Software List

**SOFTWARE LIST for MAINFRAME COMPUTERS MVS, VM/CMS, UNIX**

Each programming language or package available at UTCS has a support level. In general, Class A Products receive full support, Class B limited support (as time and resources allow), Class C no active support. For complete details of UTCS product support policy, see the UTCS GUIDE TO PRODUCTS AND SERVICES: Introduction.

| Package/Compiler | System | Support | Version |
|---|---|---|---|
| **Communications** | | | |
| Kermit | VM/CMS | A | --- |
| | UNIX | B | 4C(058) |
| FTS | VM/CMS | A | --- |
| MAIL/MAILBOOK | VM/CMS | A | 86.359 |
| MICROLASER | VM/CMS | A | --- |
| macget/macput | UNIX | C | --- |
| netcopy, netexec, to (NetNorth Tools) | UNIX | B | --- |
| xmodem | UNIX | C | --- |
| ftp,rsh,rlogin,telnet,rep<br>*(Access via TCP/IP to most of the networked machines on all three campuses)* | UNIX | B | --- |
| rn/Pnews | UNIX | B | --- |
| mail,mh,Mail | UNIX | - | --- |
| rje | UNIX | B | --- |
| **Graphics** | | | |
| PLOTBASIC (FORTRAN) | MVS | A | --- |
| | VM/CMS | C | --- |
| PLOTBASIC EXTENDED ROUTINES | MVS | A | --- |
| SAS/GRAPH | MVS | A | 82.4; 5.08 |
| | VM/CMS | A | 82.3; 5.08; 5.16 |
| SURFACE II | MVS | C | --- |
| **Languages** | | | |
| APL (Sharp) | MVS | C | May 83 |
| ALGOLW (Stanford) | MVS | C | n/a |
| ASSEMBLER(F) | MVS | C | 2.1 |
| | VM/CMS | C | --- |
| A.A.E.C. PASCAL | MVS | C | 2.0 |
| Concurrent Euclid | VM/CMS | C | 1.9 |
| FORTRAN H EXT. | MVS | B | 2.2.1 |
| FORTUTILS | VM/CMS | A | 2.2 |
| LISP | MVS | C | --- |
| MARKEXAM | MVS | C | --- |
| PL/C | MVS | C | --- |
| PL/I CHECKOUT COMPILER | MVS | B | 1.3.0 |
| | VM/CMS | B | 1.3.0 |
| PL/I OPT COMPILER | MVS | B | 1.4.0; 1.5.0 |
| | VM/CMS | B | 1.4.0; 1.5.1 |
| REXX | VM/CMS | A | --- |
| SNOBOL 4 | MVS | C | 3.5 |
| | VM/CMS | C | 3.5 |
| SPITBOL | MVS | C | --- |
| Turing | VM/CMS | C | --- |
| UTCS FORTRAN UTILITIES | MVS | B | --- |
| VS COBOL | MVS | C | 2.4 |
| VS FORTRAN | MVS | A | 1.4.1 |
| | VM/CMS | A | 1.4.1 |
| VS Pascal | VM/CMS | C | 2.1; 2.2 |
| WATBOL | MVS | C | V3L2 |
| Waterloo C | VM/CMS | C | 1.2 |
| WATFIV | MVS | B | --- |
| | VM/CMS | C | V2L0 |
| WATFOR-77 | VM/CMS | A | 1.3 |
| cc | UNIX | A | --- |
| f77 | UNIX | C | --- |
| ratfor | UNIX | C | BSD std. |
| ttc | UNIX | C | --- |
| pc | UNIX | C | BSD std. |
| yacc | UNIX | C | --- |
| awk | UNIX | C | --- |
| adb,dbx | UNIX | C | BSD std. |
| **Numerical** | | | |
| DYNAMO | MVS | B | 4.07 |
| EISPACK | MVS | C | 4 |
| FORMAC | MVS | C | --- |
| FUNPACK | MVS | C | --- |
| GPSS | MVS | A | Rel.1, Mod. Level 4 |

## Software List continued

| Package/Compiler | System | Support | Version |
|---|---|---|---|
| LINPACK | MVS | C | --- |
| | VM/CMS | C | --- |
| MINOS | MVS | C | 4.0 |
| MINPACK | MVS | C | 1 |
| MPSX | MVS | C | Rel.1, Mod. Level 6 |
| NAg | MVS | A | Mark 11 |
| **Statistical** | | | |
| BMD | MVS | C | --- |
| BMDP | MVS | A | Level 85 |
| | VM/CMS | A | Level 83, Level 85 |
| GENSTAT | MVS | C | 4.04B |
| IMSL | MVS | A | 9.2 |
| | VM/CMS | A | 9.2 |
| Minitab | VM/CMS | B | 82.1; 5.1 |
| NAg | MVS | A | Mark 11 |
| NTSYS | MVS | C | Dec. 1982 |
| SAS | MVS | A | 82.4; 5.08; 5.15 |
| | VM/CMS | A | 82.3; 5.16 |
| SPSS | MVS | C | 9.1 |
| SPSS$^x$ | MVS | A | 2.1; 2.2 |
| | VM/CMS | A | 2.1; 2.2 |
| TSP | MVS | C | 3.5 |
| **Text Processing** | | | |
| COGS (Concordance Generating System) | MVS | B | 3.1 |
| KWIC | MVS | C | --- |
| OCP (Oxford Concordance Program) | MVS | C | 1.4 |
| SCRIBE | VM/CMS | A | 4(1400)-1 |
| Waterloo SCRIPT | MVS | B | 85.1 |
| | VM/CMS | B | 85.1 |
| XEDIT | VM/CMS | A | --- |
| 8700 Pseudotypesetting | VM/CMS | A | n/a |
| MICROLASER | VM/CMS | A | --- |
| ed | UNIX | A | --- |
| vi | UNIX | C | --- |
| cmacs | UNIX | C | --- |
| spell | UNIX | C | --- |
| diction/explain | UNIX | C | --- |
| eqn | UNIX | A | --- |
| tbl | UNIX | A | --- |
| pic | UNIX | C | --- |
| troff | UNIX | A | --- |
| nroff | UNIX | A | --- |
| TeX | UNIX | C | --- |
| **Utilities** | | | |
| DFSORT | MVS | A | 6.0 |
| DSMAP | MVS | A | --- |
| FILEBOL | MVS | C | --- |
| FORTUTILS | VM/CMS | A | 2.2 |
| GRIPE | MVS | A | --- |
| IBM UTILITIES | MVS | | --- |
| IEBGENER | MVS | A | --- |
| IEBCOPY | MVS | A | --- |
| IEHMOVE | MVS | A | --- |
| TAPEPRT | MVS | A | --- |
| TAPEEXRAY | MVS | A | --- |
| TCOPY | MVS | A | --- |
| TPRINT | VM/CMS | C | --- |
| UTCS FORTRAN UTILITIES | MVS | B | --- |
| crypt | UNIX | A | BSD std. |
| compress | UNIX | C | BSD std. |
| csh | UNIX | B | BSD std. |
| diff | UNIX | A | BSD std. |
| grep | UNIX | A | BSD std. |
| ipr | UNIX | B | --- |
| learn | UNIX | C | BSD std. |
| patch | UNIX | C | --- |
| sed | UNIX | A | BSD std. |
| sort | UNIX | A | BSD std. |
| sh | UNIX | A | BSD std. |
| tar | UNIX | A | BSD std. |
| uniq | UNIX | A | BSD std. |

## Software List continued

**SOFTWARE LIST for MICROCOMPUTERS**

The following are microcomputer software packages for which UTCS can provide either support or some information. As with mainframe products, micro packages receive full support (Class A), limited support (Class B), or no active support (Class C). The specific criteria differ from those for mainframe classes and are outlined in the *Academic's Guide to Microcomputer Systems.*

| Package/Compiler | Support | Version |
|---|---|---|
| **Communications** | | |
| Kermit (MS-DOS) | A | 2.27d |
| Kermit (APPLE II) | A | --- |
| Kermit (CP/M) | C | --- |
| Kermit ( Macintosh) | B | --- |
| PC TALK3 | C | --- |
| PC PLOT III | A | --- |
| ProComm | A | 2.42 UT |
| MacTerminal | B | --- |
| WYLBUR/PC | C | --- |
| **Database Managers** | | |
| AskSam | C | 2.2 |
| Clipper | B | --- |
| DATAEASE | B | --- |
| dBASE II (CP/M) | B | --- |
| dBASE II (MS-DOS) | C | -- |
| dBASE III | A | 1.1 |
| dBIIICompiler | B | 1.1 |
| FoxBASE | C | 2.14u |
| Notebook II | B | 2.03 |
| REFLEX | B | --- |
| ViewFinder III | B | --- |
| ZyINDEX | B | --- |
| **Graphics** | | |
| DR HALO | C | --- |
| Lotus 1-2-3 | B | --- |
| Microsoft CHART (Macintosh) | C | --- |
| MacPaint | B | --- |
| WATCOM GKS | B | --- |
| 35mm Express | B | --- |
| **Languages** | | |
| BASIC | A | --- |
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| WATFOR-77 | A | --- |
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| APPLE Turnover (Macintosh) | A | --- |
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| FASTBACK | B | --- |
| PC-DOS | A | --- |
| Sidekick | B | --- |
| SuperKey | C | --- |
| TURBO Lightning | C | --- |
| XenoDisk | A | 1.41 |
| **Spreadsheet** | | |
| APPLEWORKS | C | --- |
| Lotus 1-2-3 | B | 2.01 |
| Multiplan (Macintosh) | C | --- |
| **Statistical** | | |
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| PowerStat | C | 1.04 |
| SAS/PC | A | 6.02 |
| SPSS/PC + | A | --- |
| STATPRO | C | 2.0c |
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| FinalWord II | B | 2.0 |
| MacWrite | C | --- |
| Microsoft Word (Macintosh) | A | --- |
| Microsoft Word (MS-DOS) | B | 2.0 |
| Nota Bene | B | --- |
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